NASA TECHNICAL STANDARDS PROGRAM OVERVIEW

Presenter: Thomas A. Torres
Author: Paul Gill
Manager,
NASA Technical Standards Program

Program Objectives and Authority

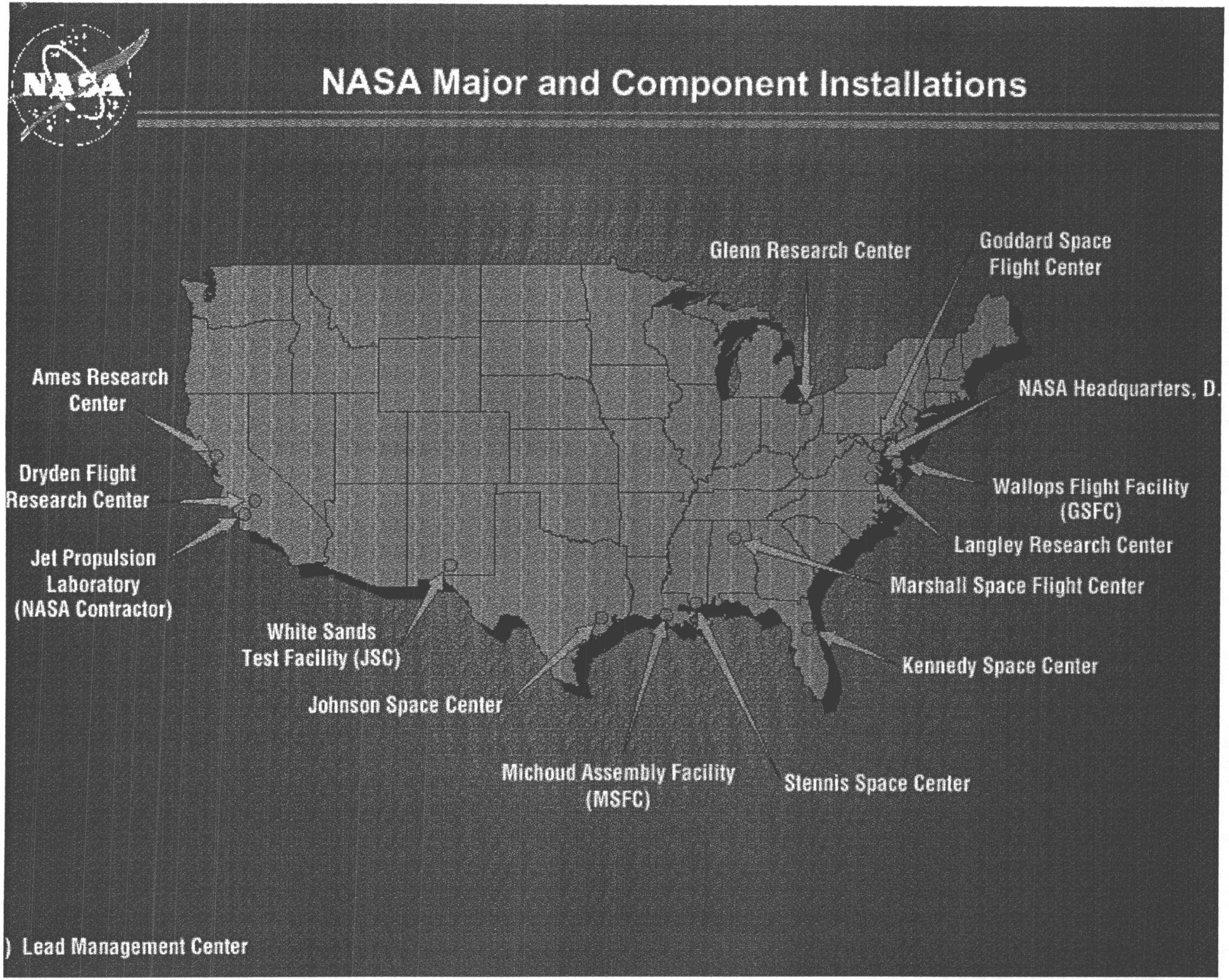
Objectives

- **Establish and Maintain "NASA Preferred Technical Standards" As a Common Baseline for NASA Programs**
  - Develop Internal NASA Standards Where Available Standards Are Not Adequate
  - Evaluate, Support, and Adopt National and International Standards Where They Meet NASA's Needs
- **Support the Use of Technical Standards on NASA Programs in the Systems Requirement Process**
  - Provide Access for All <nasa.gov> Users to Full Text Standards From >100 Sources at http://standards.nasa.gov
  - Linking Standards to Lessons Learned for More Effective Use
  - Automated Notice of Updates for Standards Registered by Users

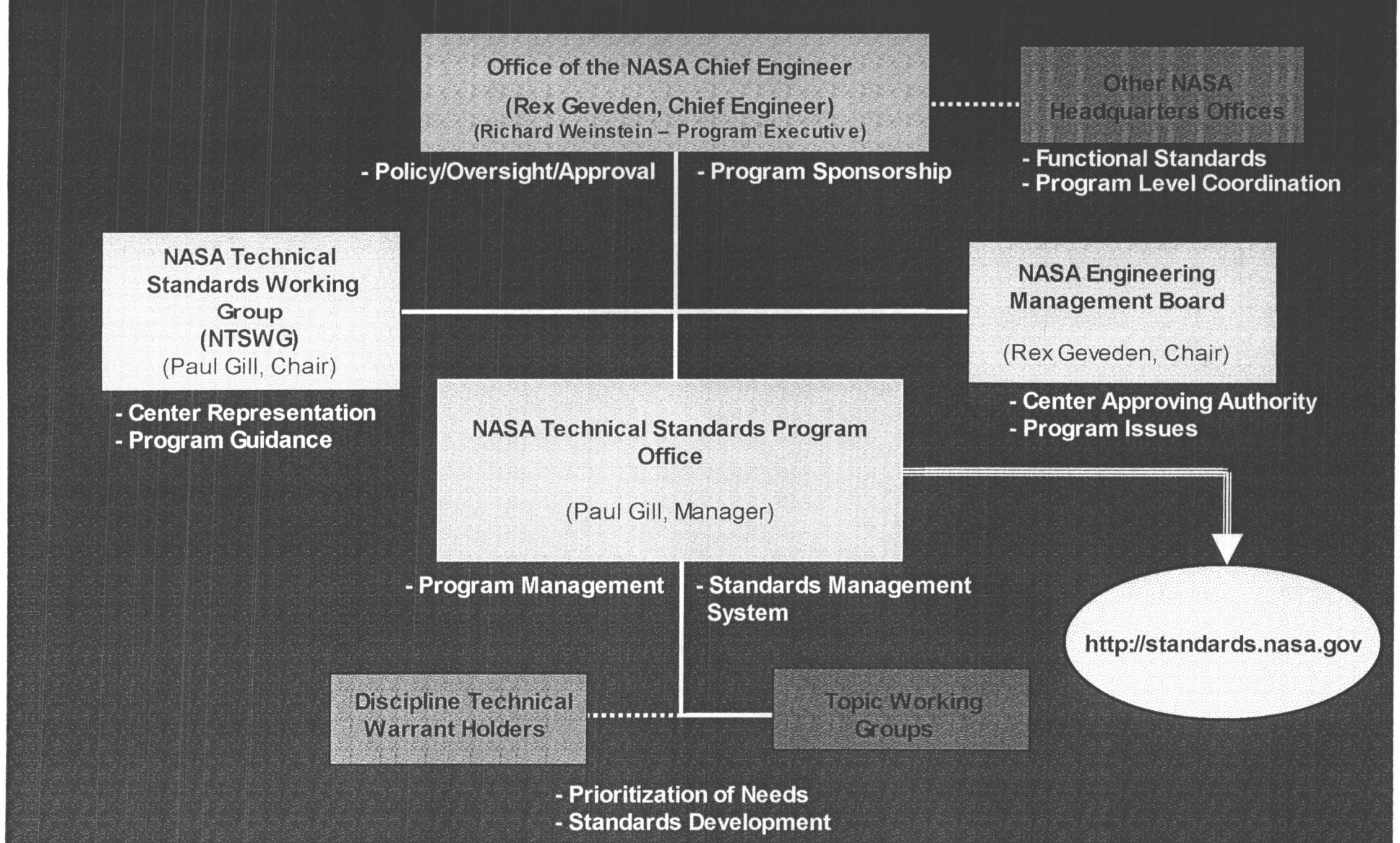
Authority:

- NPD 8070.6B, "Technical Standards", May 7, 2003
- NASA Preferred Technical Standards Program Plan, April 15, 1999
- OMB Circular A-119, "Federal Participation In The Development And Use Of Voluntary Consensus Standards And Conformity Assessment Activities" (1998)
- NPR 8070.X , Technical Standards Processes (In Development)

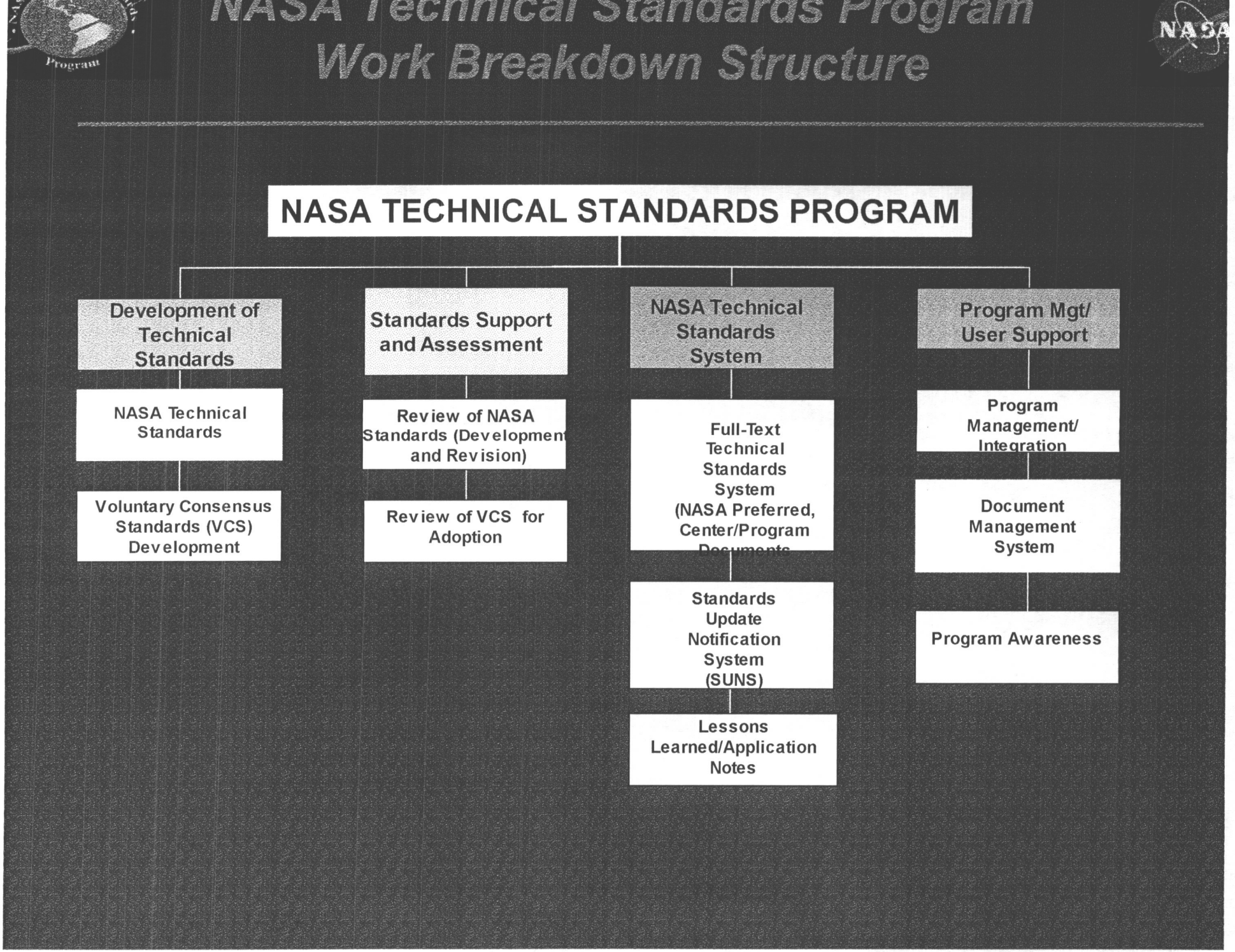
NASA Major and Component Installations



NASA Technical Standards Program Structure



NASA Technical Standards Program Work Breakdown Structure



NASA Preferred Technical Standards Taxonomy

Documentation and Configuration Management, Program Management Configuration & Documentation Mgmt, Packaging, shipping & Handling, Reproduction & Document Archiving
Systems Engineering and Integration, Aerospace Environments, Celestial Mechanics Orbital & Celestial mechanics, Aerospace Environments, System Engineering and Integration
Computer Systems, Software, Information Systems Computer Design (Flight & Ground), Software Design (Flight & Ground), Computer & Software Security, Information Systems(ADP) & Network Communications Design
Human Factors and Health Ergonomics, Health Science
Electrical Systems, Electronics, Avionics/Control systems, Optics Electrical / Electronic Design including Printed Circuit Boards & Electrical Ground & Airborne Support Equipment Electromagnetics and Electrical Discharge Control Guidance & Control, & Optics
Structures/Mechanical systems, Fluid, Thermal, Propulsion, Aerodynamics Structural Design including Stress Corrosion control, Mechanical Design Including Mechanical & Propulsion Ground and Airborne Support Equipment, Propulsion Design, Thermal Design, Flight & Fluid Dynamics
Materials and Processes, Parts Materials &Materials testing including Fluids & Propellants, Material Processes, manufacturing, Parts (Mechanical, Electrical, Optical)
System Test, Analysis, Modeling, Evaluation System and Subsystem testing including Environmental testing, Test Evaluation, Analysis and Modeling
Safety, Quality, Reliability, Maintainability Safety (Flight, ground, Personnel and Equipment), Quality (Hardware and Software), Reliability (Hardware and Software) Maintainability (Hardware and Software)
Operations, Command, Control, Telemetry/Data Systems, Communications Flight and Ground Operations, Mission Command & Control, Telemetry and Data Systems Design, RF Communicatins Design
Specifications and Standards for use on Construction Projects (SPECSINTACT) Facilities Design, Roads and Grounds Support (Local transportation, fire control, Telephones, Health Care, Etc.)

Standards Nomenclature

- Available Standards
  - Anything accessible through Technical Standards website
- Preferred Standards
  - Recommended by Centers on basis of experience; not "certified"
  - Intended as a starting point for selecting project standards; no claim of completeness
  - Other Centers must concur they're acceptable for appropriate use
  - No major concerns preventing use; specific limitations to be addressed in "Applications Notes"
  - Can come from any source (NASA, DoD, Standards Developing Organizations)
- *Core Standards*
  - *A select list of priority standards considered critical for controlling risk, addressing recurring problems, providing necessary insight and control; not limited to human safety*
  - *To be addressed by all programs unless waived*
  - *May tailor sub-sets for program types, e.g. robotic spacecraft*
- Mandatory Standards
  - Those core standards interpreted, tailored, and applied to a specific program or on contracts

Standards Adoption Summary
Status To Date

- **Adopted/Pending Adoption Summary**
  - **Total 3,407 – (1,774 Performance, 1,633 Acquisition)**
    - **62 NASA Developed Technical Standards**
      - 26 Engineering Standards
      - 18 IT Standards
      - 18 Safety And Mission Assurance
    - **2,267 Adopted (Non-NASA) - (981 Performance, 1286 Acquisition)**
      - 1,568 Voluntary Consensus Standards
      - 671 Military Specifications and Standards
      - 28 Federal and CID Standards
    - **1,078 Pending Adoption (Non-NASA) - (731 Performance, 347 Acquisition**
      - 11 AIAA and 61 ISO Performance Standards Sent to NTSWG for Endorsement
      - 347 Acquisition and 659 Performance Standards Not Yet Sent Out to NTSWG
- **NASA Participation In Non- Gov't Standards Development For FY05 Per OMB Circular A-119**
  - **30 SDOs**
  - **147 Participants**
  - **197 Standards**

NASA Technical Standards Program

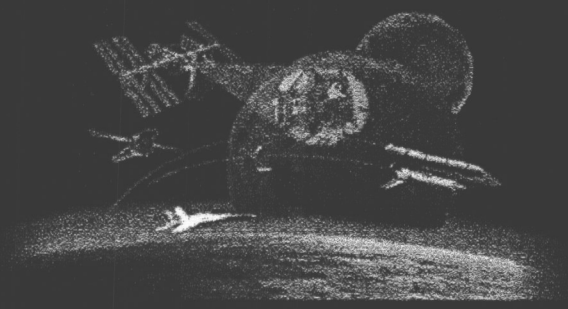
Overview | Feedback | Tutorial | Help | FAQ | Disclaimer

ASA ACCESS (Registration/Logon)

- Agencywide Full-Text Technical Standards System (Access To NASA Preferred and Other Technical Standards Products)
- Standards Update Notification System (SUNS)
- NASA Technical Standards Management System
- NASA Participation In Committees and Working Groups
- Standards Developing Organizations
- Lessons Learned / Best Practices

UBLIC ACCESS (Registration/Logon)

- NASA Preferred Technical Standards Products
- Standards Developing Organizations
- Lessons Learned / Best Practices



What's New

Standards.Gov Website--National Institute of Standards and Technology

The Future of Aerospace Standardization

Engineering Lessons Learned And Systems Engineering Applications

Privacy Statement

---

onsored By: Office Of The NASA Chief Engineer
ndards Executive: Richard Weinstein

ogram Manager:	Paul Gill
stem Manager:	Brenda Lance
rators:	Ellen Jones/Kalpana Shiva

Accessibility Statement

This page modified on 04/29/2004

Agencywide Full-text Technical Standards System

- Initiated in FY2000: competitive, 5 year, fixed price contract
- Non-Gov't Standards Listings available to public; full text documents to nasa.gov only
- Provides "one stop", transparent access to standards from more than 111 Standards Developing Organizations (SDO's)
  - NASA "*preferred*" technical standards:
    - Technical standards developed by NASA
    - Adopted standards from other sources
  - *Center developed standards (JSC, KSC, MSFC, etc.)*
  - Program documents: Shuttle, Space Station, Payloads
  - *Other government standards (FAA, Navy, DoD, DoE, etc)*
- Extensive metrics: accesses, downloads, documents, requestors...
- *Over 280,000 Standards Products downloaded in 4 years*

Standards Update Notification System (SUNS)

- SUNS Allows Users To Register Standards They Use, And Receive Automatic Notification When Standards Are Revised, Re-issued
- Changes To Technical Standards Can Have Major Impacts On The *Safety*, *Performance*, *Reliability*, And *Cost* Of Programs/Projects
- Using Out-of-Date Standards—Unless Required To Meet Specific Need
  - Ignores Improvements And Misses The *Benefits* Of Experience
  - Exposes Programs/Projects To The *Risk* Of Repeating Those *Failures* That Led To Update Of The Standard
- For All NASA Programs/Projects To Date:
  - *7875 Document Update Requests Received*
  - *3136 Document Update Notifications Sent*

Lessons Learned-Technical Standards Integration

- NASA Lessons Learned System Documents Problems And Improved Guidance From Program And Project Experience
- Linking Lessons Learned With Standards Provides Basis For Interpretation/Use And Update Of Standards
- Users Alerted To Lessons Learned At The Time They Search For The Standards
- Current Status
  - Over 600 Out Of 1700 Lessons Learned Now Hot-linked To 420 NASA Preferred And Non-government Technical Standards
  - "Reverse" Search Capability Permits Users To View Specific Lessons Learned By Technical Discipline And View The Standards Linked To Them
  - Now Adding "Application Notes" From Standards Users That Clarify Or Limit The Scope, Use, Or Context Of Standards; Over 170 Linked To Date
  - Use Of Lessons Learned System Increasing Throughout The Agency

Document Summary Page

MIL-STD-1686	Revision: C	Status: Active	NASA Status: Preferred
DISS info	No. of NASA Accesses since 06/2001: 118	SDO: MIL	Year Reaffirmed:
LE: ELECTROSTATIC DISCHARGE CONTROL PROGRAM FOR PROTECTION OF ELECTRICAL AND ELECTRONIC PARTS, SEMBLIES AND EQUIPMENT (EXCLUDING ELECTRICALLY INITIATED EXPLOSIVE DEVICES) (SUPERSEDING MIL-STD-6B)			Request Standard Update Notification
Base	Date: 10/25/1995	19 pages	View Doc / View TOC

Document Scope

ase - 10/25/1995]

purpose of this standard is to establish comprehensive requirements for an ESD control program to minimize the effects of ESD on parts, assemblies, and equipment. effective ESD control program will increase reliability and decrease both intenance actions and lifetime costs. This standard shall be tailored for various types of acquisitions.

Application Notes

Submit Application Note

plicable evision	Project ID	NASA Center	Creation Date	Note
All	-	JPL	4/26/2001	Requires that each facility have a document that describes how they implement ESD controls (for example, see MSFC-RQMT-2918).

Lessons-Learned and Best-Practices

LL/BP No.	Title	Date	Relevance to the Standard
SFC-0032	Assessment and Control of Electrical Charges		This practice references the use of MIL-STD-1686 to establish comprehensive requirements for an ESD control program to minimize the effects of ESD on parts, assemblies, and equipment.
LIS-0151	Throat Plug and Purge Adapter Assembly Grounding	10/8/1992	This lesson addresses a scenario where improperly grounding the throat plug and adapter assembly or a lack of grounding may cause static electricity build-up and electrical sparks which could act as an ignition source for any flammable vapors present.
LIS-0301	Electrostatic Discharge (ESD) Wrist Strap Contamination of Magellan Flight Hardware	9/15/1993	Electrostatic Discharge (ESD) wrist straps can shed conductive METALLIC fibers into electronic hardware.
LIS-0685	Electrostatic Discharge (ESD) Control in GSE	2/1/1999	The Lesson provides technical recommendations for the control of ESD in aerospace equipment.
LIS-0732	Electrostatic Discharge (ESD) Control in Flight Hardware	2/1/1999	The Lesson addresses the generation of triboelectric and electrostatic charges as a common cause of damage and/ordegradation to unprotected Electrostatic Discharge Sensitive

Technical Standards System User Surveys

Standards Data Base Survey (6732 unique users)

Requirements for Program/Project Development	In-House R&D (Including Design, Analysis, Testing, Etc.)	Verification of a Contractor's Processes on Programs/Projects	Acquisition of Parts or Materials	Evaluation of Proposal(s)	Education and Training	Other Use
2335 (23.7%)	2873 (29.2%)	1677 (17.0%)	842 (8.5%)	325 (3.3%)	1210 (12.3%)	569 (5.7%)

Technical Standards System
A Resource for All Users
http://standards.nasa.gov

- The Technical Standards website can be used by *all* <nasa.gov> users as a resource to:
  - Search for available standards on a subject
  - Download personal copies of standards
  - Evaluate/select standards for projects or other uses
  - Identify Lessons Learned associated with standards
  - Register standards used to get notice of updates (SUNS)
  - Submit their advice on use of standards for others
  - Submit proposals for development of new standards
  - Register information of participants working on non-NASA standards